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Sweet Sorghum Variety Demonstrations 1919

SUGAR DRIP SORGHUM

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N. C. State Department of Agriculture
N. C. Agricultural Experiment Station, and
U. S. Department of Agriculture, Coöperating

Agricultural Extension Service

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Raleigh and West Raleigh

Variety test sorghum at Mountain Test farm, Swannanoa. On the left, Red Ar just coming into head; center, Early Amber in full head; right, Coker's Pedig Amber in almost full head.

The plantings were made on the Mountain Test farm, Swannan farm of George F. and R. J. Lutz, Newton; farm of Thomas D. H din, Greensboro; Experiment Station Farm, Raleigh; farm of Cha J. Heath, Ernul, Craven county; farm of J. T. White, Tyner, Chow county.

The high water of July stood so long on the last named plat th for test purposes, it was abandoned.

All the information sought was not obtained, nor was it expec that it would be in one year, but much valuable data was gathe which will be supplemented by future demonstrations. In gene safe deductions cannot be made from work of this character until (ried through a series of four or five years.

However, some opinions expressed in other articles were thoroug confirmed. For example, the work showed quite convincingly that long-maturing varieties produce a much greater amount of sirup, equally good quality, to the unit of area than the short-matur kinds. Consequently, unless for some special purpose, it is not profitable to grow a short-maturing variety where the period fr frost to frost is 120 days or more as it is to grow the long-matur varieties. In every case the longest maturing varieties, as Su Drip, with a record of 443 gallons per acre at Mountain Test fa

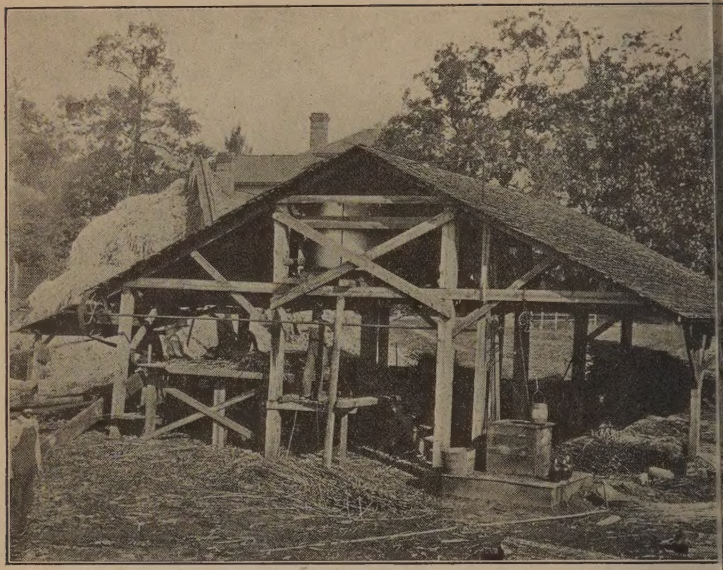
nd an average of 218 in all tests; Red Amber, with a maximum of 11.6, at Heath farm, and an average of 319; Honey, or Japanese eeded Ribbon, with a maximum of 411, at Hardin farm, and an av-rage in all tests of 370.6 gallons far excel all the short-maturing va-ieties, as reference to the appended tables will show.

This comparison may not be quite fair to the short-maturing varie-es for the reason that in every test except at the Mountain Test arm, these varieties were from two to five weeks overripe before they ere harvested and milled, while the long-maturing varieties were arvested and made into sirup at about the proper condition of ripe-ess. This was unfortunate, but it could not be avoided on account of abor shortage.

That some varieties will stand for a longer period than others after pening without deterioration of juice was also confirmed by the tests. n this respect the Amber varieties were first with Sugar Drip a close econd. In the case of the Ambers very little difference appeared n color and quality of sirup when made at the proper stage of ripe-ess, or when three to four weeks overripe. With the Sugar Drip the hange was slight under similar conditions, while with other varieties hat became overripe the sirup was both darker in color and of a less leasing flavor. In this connection it is well to note that in all cases here the crop was harvested when the seed was in the dough, or even ate milk stage, and milled within a few days the product was of a righter color and milder flavor than where it was even slightly over-ipe, and the quantity of sirup procured was not notably less.

Nothing definite was learned with reference to the influence of the olor of soil on the color of sirup. It is doubtful if this influ-nce is as great as many persons think, since it would require a fine ense of color to distinguish any difference in the sirup made from ither Red Amber or Japanese Seeded Ribbon at Greensboro and at Irnul. In these two cases, the crop was in about the same condition f development when harvested and worked. The soil color was astly different, yet the sirup color of each variety was the same at oth places, or so nearly so, that it would require a color expert to ote a difference. Undoubtedly the condition of the crop when arvested, the length of time between harvesting and milling, the ethod of cleansing juice, and quickness of evaporation, all have nore influence on color of sirup than has the color of the soil on hich the crop is grown.

The use of fertilizers of different grade on dissimilar soils under aried local conditions made it impossible to draw any conclusions n the effect of fertilizers on quality of sirup. To gain definite knowl-dge of such it seems necessary that the various fertilizers be used t the same place and on the same kind of soil.



Crusher and storage sheds for sorghum, showing water supply tank and bag carrier at sirup mill of Geo. F. and R. J. Lutz, Newton, N. C.

Tests with the Brix hydrometer were made of the juice of all rieties in all the plantings except at Raleigh. The readings were made after the juices were well settled and carefully strained, in most cases were unusually high. While the Brix merely sh the percentage of solids in juices this percentage closely approxim the sugar content in well settled juices, unless a chemical change taken place therein. The quotient of 100 divided by the Brix read so closely approximated the number of gallons of juice necessary make one gallon of finished sirup, in all cases, that it might be ca a constant.

For example, if the Brix reading was 20 degrees, five gall of juice was required for a gallon of sirup.

This test proved so exact that in repeated experiments with ju in quantities of from four hundred to five hundred gallons the act amount of sirup secured was never over one gallon different from t expected from the computation. This slight difference was proba due to waste in the evaporators and other vessels, so that the compu tion may be said to be exactly correct.

It is possible that the high sugar content shown in many cases was due to the unusually dry weather of late summer and fall. In this connection it is interesting to note that the Brix readings were as much as 4 degrees lower in the same varieties after four or five days of rain than they were before the rain.

Of the varieties used in the test, the results seem to indicate that Honey, or Japanese Seeded Ribbon, would be the most desirable to grow in regions outside the mountains. This variety has one weak point in that the stalk, which grows both tall and heavy, is somewhat soft and does not withstand strong winds as well as some other varieties.

Red Amber, so called for the purposes of this demonstration, the true name of which is Honduras, ranks second. This variety has been found in the State under the following names in addition to Red Amber: Broom Corn Cane, David Alexander's Cane, Japanese Seeded Ribbon, Georgia Ribbon, Red Ribbon, Georgia Seeded Ribbon, Honey Top, Honey Cane, Mastodon, and Sprangle Top. It is probably of Natal origin and brought to this country under its Natal name of Vim-bis-chu-a-pa, but the name was soon changed, for unknown reasons, to Honduras, by which it was known during its

Power plant and evaporator at sorghum mill of Geo. F. and R. J. Lutz, Newton, N. C. The evaporator is copper, 4 x 24 feet. This is one of the most up to date sorghum sirup factories in the state.

early history in this country. It develops a large and strong st and yields a sirup of good color and mild flavor.

The Sugar Drip stands third, and from every viewpoint is very good variety. It yields a fairly heavy tonnage, its stalk strong, and the sirup is of excellent flavor and color.

These demonstrations strongly indicate that with careful selecti of varieties and purity of seed, with proper cultivation and rig methods of harvesting and manufacture, from 300 to 400 gallo of sirup may be made from an acre of sorghum. With such retu it is a valuable money crop.

For the mountain region any of the Ambers are desirable, alo with Sugar Drip in the valleys where it will ripen.

Future tests may prove other varieties equally as good, but would be well for sorghum growers to make some tests for themselv

Grateful acknowledgment is hereby made to the following pers through whom the coöperative tests were made possible.

To Supt. S. C. Clapp of the Mountain Test farm, and Supt. A. Russell, of the Experiment Station farm, Raleigh, for their intere courtesy and assistance. To Messrs. George F. and R. J. Lutz, Ne ton; Thomas D. Hardin, Greensboro; Charles J. Heath, Ernul; J. White, Tyner, for use of land, for labor, for constant kindness a assistance in every way.

The following tables give the detailed results of all test plantii and are worth a careful perusal on the part of the reader.

At some places no scales were available for weighing, and all data desired could not be secured.

TEST ON BUNCOMBE OR MOUNTAIN TEST FARM, SWANNANOA, N. C.

SOIL—Toxaway Silt Loam

FERTILIZER—500 Pounds 11-2-0 Per Acre

DATE OF PLANTING—May 12

Varieties	Number Days from Planting to Maturity	Weight of Crop Per Acre in Tons	Gallons Juice Per Acre	Per Cent Weight of Stalk Extracted in Juice	Pounds of Stalk for Gallon of Juice	Number Gallons Juice for Gallon Sirup	Brix	Gallons of Sirup Per Acre	Condition of Seed When Crop Was Harvested
Early Amber	120	9.886	1,295	56.34	15.26	12.66	8.5	102.0	Late dough.
Coker's Pedigreed Amber	126	10.602	1,364	50.20	15.55	12.31	9.0	110.8	Late dough.
Red Amber	143	18.051	2,352	57.33	15.35	7.66	13.5	306.8	Late dough.
Sugar Drip	143	18.375	2,455	59.44	14.97	5.54	16.9	443.0	Early dough.

TEST ON FARM OF GEO. F. AND R. J. LUTZ, NEWTON, N. C.

SOIL—Cecil Clay

FERTILIZER—None

DATE OF PLANTING—May 15

Varieties	Number Days from Planting to Maturity	Weight of Crop Per Acre in Tons	Gallons Juice Per Acre	Per Cent Weight of Stalk Extracted in Juice	Pounds of Stalk for Gallon of Juice	Number Gallons Juice for Gallon Sirup	Brix	Gallons of Sirup Per Acre	Condition of Seed When Crop Was Harvested
Early Amber	100	2.750	368	60.95	14.93	4.66	21.7	78.9	3 weeks over-ripe.
Coker's Pedigreed Amber	100	4.500	526	52.98	17.10	4.80	20.8	109.5	3 weeks over-ripe.
Red Amber	160	6.530	842	57.10	15.50	5.57	15.3	184.0	Late milk stage.
Sugar Drip	150	6.710	737	45.75	18.20	4.44	16.2	165.8	Late dough stage.
Coker's Pedigreed Sumac	110	3.566	421	53.90	16.94	4.40	22.6	94.7	2 weeks over-ripe.
Early Rose	100	6.052	605	45.35	19.98	5.00	20.8	121.0	4 weeks over-ripe.
Honey or Japanese Seeded Ribbon	160	16.580	2,000	53.50	16.60	6.08	16.0	328.9	Late milk stage.

TEST ON THOS. D. HARDIN'S FARM, GREENSBORO, N. C.

SOIL—Iredell Fine Sandy Loam

FERTILIZER—300 Pounds to Acre of Phosphoric Acid 16 Per Cent and Cotton Seed Meal, One-half Each

DATE OF PLANTING—May 24

Varieties	Number Days from Planting to Maturity	Weight of Crop Per Acre in Tons	Gallons Juice Per Acre	Per Cent Weight of Stalk Extracted in Juice	Pounds of Stalk for Gallon of Juice	Number Gallons Juice for Gallon Sirup	Brix	Gallons of Sirup Per Acre	Condition of Seed When Crop Was Harvested
Early Amber	100	6.607	654	44.36	20.20	5.64	18.0	116.3	5 weeks over-ripe.
Coker's Pedigreed Amber	100	8.645	785	40.77	22.00	5.40	18.8	149.5	4 weeks over-ripe.
Red Amber	140	15.215	2,243	65.82	14.16	6.00	17.3	373.8	Late milk stage.
Sugar Drip	135	10.533	1,121	48.45	18.78	7.50	21.0	149.5	Late dough stage.
Coker's Pedigreed Sumac	115	6.084	654	47.85	18.60	5.47	17.0	119.6	3 weeks over-ripe.
Early Rose	90	3.327	374	50.33	17.80	11.30	18.0	33.0	6 weeks over-ripe.
Honey or Japanese Seeded Ribbon	150	18.184	2,617	63.88	13.90	6.36	16.0	411.0	Early dough stage.
Coleman	120	9.343	1,065	51.87	17.35	5.14	19.1	207.5	2 weeks over-ripe.
Hardin's Own Sugar Drip	140	9.084	1,271	62.26	14.90	5.66	17.0	224.2	Ripe.

This crop was harvested and milled without stripping. Weights of crop are given with a 12 per cent deduction for weight of leaves.

TEST ON EXPERIMENT STATION FARM, RALEIGH, N. C.

SOIL—Cecil Sandy Loam

FERTILIZER—400 Pounds 7-3-1½ Phosphoric Acid and Cotton Seed Meal Per Ac

DATE OF PLANTING—June 2

Varieties	Number of Days from Planting to Maturity	Weight of Crop in Tons Per Acre
Coker's Pedigreed Amber	95	3.240
Red Amber	130	6.190
Sugar Drip	115	5.412
Coker's Pedigreed Sumac	95	3.132
Early Rose	90	3.204
Honey or Japanese Seeded Ribbon	140	8.940
Coleman	110	4.111

Unfortunately the remainder of the data on this crop could not be procured.

TEST ON FARM OF C. J. HEATH, ERNUL, CRAVEN CO., N. C.

SOIL—Probably Portsmouth Sandy Loam

FERTILIZER—500 pounds 8-2-1 per acre

DATE OF PLANTING—June 10

Varieties	Number Days from Planting to Maturity	Weight of Crop in Tons Per Acre	Brix	Gallons of Sirup Per Acre	Condition of Seed When Crop Was Harvested
Coker's Pedigreed Amber	110		16.0	122.0	3 weeks over-ripe.
Red Amber	140		16.1	411.6	Late milk stage.
Sugar Drip	120	Unable	17.0	113.6	Late dough stage.
Coker's Pedigreed Sumac	115	to secure	12.0	191.0	2 weeks over-ripe.
Early Rose	100	this data.	No test.	104.0	4 weeks over-ripe.
Honey or Japanese Seeded Ribbon	150		11.5	372.0	Late milk stage.

AVERAGE OF ALL TESTS.

Varieties	Average Number Days from Planting to Maturity	Average Weight of Crop Per Acre in Tons	Average Gallons Juice Per Acre	Average Per Cent Weight of Stalk Extracted in Juice	Average Pounds Stalk for Gallon Juice	Average Gallons Juice for Gallon Sirup	Average of Brix	Average Number Gallons Sirup Pe...
Early Amber	106	6.414	772	53.88	16.80	7.65	16.1	99
Coker's Pedigreed Amber	106	6.747	892	47.98	18.22	7.50	16.2	122
Red Amber	143	11.497	1,812	60.08	15.00	6.41	15.6	319
Sugar Drip	133	10.257	1,438	52.21	17.32	5.83	17.8	218
Coker's Pedigreed Sumac	109	4.261	538	50.88	17.77	4.94	17.2	135
Early Rose	95	4.194	490	47.84	18.89	8.15	19.4	86
Honey or Japanese Seeded Ribbon	150	14.568	2,309	58.69	15.25	6.22	14.5	370
Coleman	115	6.727	1,065	51.87	17.35	5.14	19.1	207
Hardin's Own Sugar Drip	140	9.084	1,271	62.26	14.90	5.66	17.0	224

Average yield of sirup to the acre from nine varieties in five localities, 198 gallons.